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Draft EW Remedial Alternative and Disposal Site Screening Memorandum

Ravi Sanga to: Dan Berlin 10/25/2011 12:51 PM

Cc: Debra Williston - Work, Debra Williston - Home, Doug Hotchkiss, Jeff Stern, Kathy Ketteridge, Kirsten Payne, Mark Larsen, Matt Woltman, Nathan Soccorsy, Pete Rude, Peter Leon, R Carscadden, "'Rule,

From: Ravi Sanga/R10/USEPA/US

To: Dan Berlin <dberlin@anchorqea.com>

Cc: Debra Williston - Work <debra.williston@kingcounty.gov>, Debra Williston - Home (b) (6) >, Doug Hotchkiss <hotchkiss.d@portseattle.org>, Jeff Stern <jeff.stern@kingcounty.gov>, Kathy Ketteridge <kketteridge@anchorqea.com>, Kirsten Payne

Tom, Dan and Doug -- Attached are EPAs comments on the East Waterway Draft Remedial Alternative and Disposal Site Screening Memorandum. EPA expects the draft final of this screening memo to be submitted to EPA within 30 work days upon receipt of these comments.

Let me know if you have any questions.

regards,

Ravi

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Ravi Sanga, MS
Environmental Scientist - Remedial Project Manager
US EPA Region 10
Office of Environmental Cleanup
phone: (206) 553-4092
fax: (206) 553-0124

East Waterway SRI/FS

Draft Comments – Draft Remedial Alternative and Disposal Site Screening Memorandum (Aug. 2011)

Comment No.	Page No.	Section No.	Comment
1	General	General	One of the major objectives for the Screening Memo is to screen out certain technologies that will not be further evaluated in the FS. If technologies are screened out prematurely, then an applicable technology that could help achieve cleanup goals may be limited from Remedial Action or may require a ROD Amendment, ESD or at minimum, a follow-up FS evaluation to compare with the technologies evaluated in the FS. This memo needs to be clear and consistent regarding all technologies that are screened out from further evaluation from within the FS and / or if technologies may be considered during remedial design given significant changes in conditions for cost, implementability or effectiveness. Comments are provided to help standardize these responses in a way that will minimize chances that a ROD amendment or ESD would need to be developed.
2	General	General	All tables that extend across multiple pages must include the table number and title at the top of each page of the table.
3	General	General	Due to the temporal and physical proximity of LDW and EW, CERCLA activities, similarity in waterway characteristics, PRPs, and stakeholders, there are multiple points in this report where assumptions and information developed for the LDW are reasonably accepted without much discussion. However, since there are important differences between these two waterways, there are other instances where fairly significant differences in approach from LDW are also selected without much discussion. Please provide a section that summarizes major differences and similarities between the EW and LDW which help frame what information / approach from LDW may and may not apply to EW.
4	General	General	After review of the memo, it appears that one key difference with EW, which is not discussed in the LDW FS is the extent of existing structures adjacent to contaminated sediment that prevent cleanup without significant structural improvement or replacement. Please develop this discussion in this memo, including extent of occurrence in LDW and why this is much more severe in the EW.
5	General	General	In order to optimize the FS completion and evaluation process, potential alternatives will need to be presented and discussed in preliminary meetings early in the FS development process.
6	General	General	On an order of magnitude basis, the Screening Memo works to determine what types of alternatives should be brought forward for evaluation in the FS. Therefore, it is unclear what the intent of breaking up the Combined Alternative F into two sub alternatives based on SMS and CSL levels. Since specific objectives were not defined for this distinction, EPA does not expect to bring forward conclusions drawn from differences of F1 and F2 to the FS.
7	General	General	Every acronym must be spelled out the first time it appears in text though it is also in the glossary, e.g., COCs. EPA has developed an increasingly more public process for all RI/FS deliverables, and these deliverables must be reasonably "user friendly" for anyone who may want to review the record to participate in due process protected public review of EPA decision making.

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8	General	General	Consistent with the LDW RI/FS, when referring to substances to be addressed use a mix of "hazardous substances", "COCs", or "contaminants". Use "chemical(s)" only when contextually necessary as a general or a generic term for clarity which must be rarely. "Chemicals" is disfavored because CERCLA does not use "chemicals" and EPA uses CERCLA terms in its Proposed Plans and RODs. RI/FS documents form much of the most important parts of the Administrative Record supporting the Proposed Plan and ROD. For this reason, EPA directs that the terminology in the supporting RI/FS documents match the terminology in the decision documents for courts and reviewers. The use of "chemical" in the 2nd sentence of the 2nd bullet on p. 24 is an instance of an appropriate use.
9	1	1	2nd paragraph: The text provides a good, cursory definition of RAOs. Please provide a similar definition for PRGs.
10	2	1.2	Although this is addressed later in the document, please include a statement in this section that alternatives eliminated in this memo may be reintroduced in the FS or (more likely) during design if the alternatives become viable.
11	2	1.2	*1st bullet* – State that risk drivers are still being finalized within the HHRA and ERA, and that final RAOs will be based on these findings. Briefly summarize the primary exposure pathways for completeness.
12	2	1.2	Please revise the 2nd bullet to read, "Identify and screen contaminated sediment disposal technologies to eliminate those that cannot be implemented due to technical or other constraints at the site. Also, to maintain consistency with the Screening Memo organization, please list the remedial technologies bullet immediately above the disposal alternatives bullet.
13	3	1.3	2nd bullet, 3rd sentence: after the 1st 3 words insert "based on the working RAOs for the LDW site," change "will" be refined to "may," and insert "will be" before finalized.
14	3	1.3	2nd bullet, 4th sentence insert the following after "This document uses the" numerical criteria of the Washington State Sediment Management Standards (SMS)," the SQS & CSL, as.... Then add the following: "The SMS numerical criteria provide marine sediment cleanup levels for the protection of benthic invertebrates (see RAO 3 on page 22), but not for the protection of human health or for some other ecological receptors (see RAOs 1, 2 and 4). RALs are cleanup levels for specific remedial activities as part of final remedial action. PRGs, as they are refined, are the surrogate in a RI/FS for protective cleanup levels for final remedial action. Final RALs and final cleanup levels for final remedial action, the latter typically based on PRGs, will be selected by EPA in its Record of Decision (ROD)."
15	3	1.3	1st *bullet – 1st sentence* – This screening evaluation must also rely on primary exposure pathways, receptors, and risk drivers which are not discussed here. Add this in addition to language in report stating risk drivers led to conclusion that sediment cleanup is required. Note HHRA in this bullet. In 2nd to last sentence, it states "...that has not been removed or buried though thin-layer sand placement..." Clarify if this refers to historic sand placement and provide reference.

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16	3	1.3	*2nd bullet* – Note that if the final risk assessments include different assumptions assumed within this Screening Memo, the FS will account for these discrepancies to ensure proper technologies are evaluated in the FS.
17	3	1.3	*3rd bullet* - Clarify what data from the "project database" is used for this Memo. Please explain if all data to be used in the RI/FS is included. If not, specify what data is not included.
18	3	1.3	*4th bullet* - Note that the FS will refine the remedial areas to account for all other COCs. Change to "parameters exceeding the "to be determined" RALs." HHRA is noted but has not yet been discussed, please add this as a reference.
19	3	1.3	2nd bullet: change the first 2 words "cleanup levels" to "Preliminary Remediation Goals (PRGs)" and remove the reference to SMAs in this first sentence. SMAs were eliminated from the LDW RI/FS, which this SRI/FS is tracking, consistent with current regional water body/sediment site management, and SMAs are not needed for this SRI/FS.
20	4	1.3	While it is acceptable to assume that rejected alternatives will not be revisited during the FS, please acknowledge that it is possible (also during design), if determined necessary by EPA.
21	5	2	"...and the data reports provided to EPA on which the risk assessments were based..." Reference reports here by (author date) and place in Reference Section.
22	6	2.1.1	The section notes that discharge from 39 outfalls are intermittent and that the relative contribution of freshwater is small compared to flow of Duwamish River. Note how this small relative flow contribution relates to source contamination (i.e. that outfalls are important part of source control). Add a statement of how source control will be accounted for in the project (i.e. why not further accounted for here).
23	8	2.2	Please add a new subsection to the report for "Habitat Areas". Although this is described later in the document, it would be helpful to describe some of the habitat areas that are encumbered by previous agreements. Alternatively, habitat areas could also be discussed in Section 2.2.5.
24	8	2.2.1	Please investigate the apparent outfall located in the southeast corner of Slip 27. This apparent outfall is not shown in Figure 4. Please add the outfall to the figure.
25	9	2.2.2	The text reference Harley Marine Service, Kinder Morgan petroleum products transfer facility, and Harbor Island Marina. Note these locations in a figure and reference figure in text.

Comment No.	Page No.	Section No.	Comment
26	9	2.2.3	The first sentence needs revision. Please begin the paragraph with a statement that land ownership is illustrated in Figure 5, then follow with a statement that the main body of aquatic land in the EW is owned by the State of Washington and managed by DNR. For clarification purposes, all of East Waterway is State Owned Aquatic Lands. By Statute DNR does not own this land, but manages it pursuant to statutory requirements. In 1894, the State Harbor Line Commission platted it as a waterway. The Harbor Line Commission has not established harbor lines within East Waterway. Any reference to inner harbor lines in East Waterway must be eliminated. All tidelands on Harbor Island and shoreward of the eastern waterway boundary including slips 27 and 36 were sold in the early 1900's to private parties. Pier 36 is owned by the United States and operated by the U.S. Coast Guard. The U.S. Coast Guard has claimed portions of the waterway (and harbor area) fronting this base under the doctrine of navigation servitude. Federal pierhead lines have been established within East Waterway some 125 feet distant from the State East Waterway boundaries. The Port of Seattle manages the areas between the waterway boundary and the pierhead line for which it owns or controls the abutting lands under a Port Management Agreement between DNR and the Port pursuant to RCW 79.105.420 and WAC 332-30-114. Under PMA, both DNR and the Port have agreed that any permanent encumbrance, such as a cap, placed in this area must have DNR approval. DNR would be responsible for recording any restrictive covenant for this area. DNR manages the waterway between the pierhead line as a public highway reserved from sale or lease pursuant to RCW 79.120.010. Since it is also a federal waterway, DNR management authority is concurrent with the Corps of Engineers. DNR has used easements in the past to authorize remedial actions within waterways, but it must be understood that such easements are subject to the waterway's use as a public highway. Those easements were only issued after an evaluation of engineering, technical, economic, environmental and legal issues. DNR would have to apply principles of sound science and consider public use as part of its decision making process.
27	10	2.2.4	2nd paragraph: Please revise as follows: "The presence of the Spokane Street Bridge and the Railroad Bridge prohibit ~~any type of~~ **most** boat passage…"
28	11	2.2.5	It is helpful to see the common names of crabs found in the EW. Similarly, please provide common names of clams found.

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29	11	2.3	Before jumping into discussion about sediment contamination within the Nature and Extent section, add a general statement about the contaminated media of concern for this project. Since the purpose of this memo is to screen out types of remedial technologies, the report needs to clearly frame what needs to be cleaned up, which has not yet been up to this point in the memo. The text must note what sources were previously evaluated (groundwater, free products, shallow or deep contaminated sediments, DNAPL, LNAPL source areas, point sources from industry or CSO/Storm Drains, historic creosote pilings, etc.) and which of these sources were preliminarily determined to be the major risk drivers requiring remedial action - shallow and deep sediment. Also note any early action areas (or high concentration or source areas) that still need to be addressed and how this fits into the scope of the screening memo. Right now there is a big gap as to how remedial technologies related only to sediment were screened out versus other sources that may require remedial action.
30	11	2.3	"The FS will evaluate all COCs with a focused evaluation using risk drivers identified in the Draft HHRA (Windward 2011c) and Draft ERA (Windward 2011a)." Clarify that the FS will be based on finalized HHRA and ERA documents. Also add a statement in this section regarding general relationship between SQL/CSL exceedences to distribution of other COCs to help validate process used in this memo for screening alternatives.
31	11	2.3	If the deepest core is above SMS, use of depth to native material (unless already sampled beyond native material) would be a more conservative approach. Please revise.
32	11	2.3	Please revise to state that the FS will evaluate all COCs identified in the HHRA and ERA once they are finalized. The list of COCs and risk drivers could change based on suggested revisions to the ERA & HHRA.
33	12	2.3.1	1st paragraph: Please revise, "Of the 243 **sample** locations, ..."
34	12	2.3.1	2nd paragraph: Please indicate that the EW dataset includes non-SMS chemicals, however for the purposes of this memo only SMS criteria are evaluated.
35	12	2.3.1	2nd paragraph: Please revise, "**Based on these polygons**, the percentage of the EW area..."
36	12	2.3.1	Please revise, "...percentage of the area in which adverse effects ~~may~~ **are expected to** occur (i.e., greater than CSL)..." See *WAC 173-204-520, http://www.ecy.wa.gov/programs/tcp/regs/2009MTCA/issues/smsIssuePapersGlossaryJune2009.pdf* .
37	12	2.3.2	Please include a figure showing the 146 sediment core locations referenced for the SRI/FS subsurface dataset.
38	12	2.3.2	Please begin a new paragraph with the sentence, "Of the 65 locations collected..."

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39	13	2.3.2	This section requires revision with regard to differentiating between samples and sample locations. It is also difficult to tell whether the discussion focuses on the full SRI/FS subsurface data set, or just the 2010 samples. Please be careful to differentiate between these in each paragraph of this section. For example, 165 samples were analyzed for PCBs from sediment cores collected at 65 locations during the 2010 sampling event.
40	13	2.3.2	Please state how many samples from the 65 sediment cores were analyzed for each COC discussed (PAHs, BEHP).
41	13	2.3.3	Defining the depth of contamination must certainly not use the CSL. This is a screening function. CSL is way too high, & while SQS may work as a surrogate RAL, it also seems high for a screening value, though it has been used elsewhere. Limit this to SQS, not CSL. Please make these necessary changes.
42	14	2.3.3	Please describe the boundary conditions used to calculate the "clean" neatline surface (assume 0 contamination at the boundaries) shown in Figure A-1.
43	16	2.4.3	1st paragraph: Please specify whether these first paragraph conclusions apply to all reaches of the EW.
44	16	2.4.3	Add a Figure 4 reference for station reference values noted in text.
45	17	2.4.3	Please clarify the following sentence: "less likely to disturb sediments below the surface" What is considered surface? Top 10 cm?
46	18	2.4.5	Add statement of whether surface sediment results concur with PMT regarding radius of influence of outfall locations.
47	18	2.4.5	"Contaminant sources" must be changed to sources from lateral loading associated with outfalls. Other high concentration areas related to highly contaminated groundwater, or free product areas etc. must also be addressed in this Memo.
48	18	2.5	Please describe assumptions about other early action areas that may need to be addressed, other source areas, areas with free product etc. If applicable, state that based on previous findings the only media which needs to be addressed within the RA are shallow and deep contaminated sediments. Also note that contamination associated with storm drains and CSOs will be addressed separately and note where/ when this will be addressed.
49	18	2.5	1st bullet – Physical Structures - The Screening Memo did not include a detailed evaluation of likely nearshore structures that may require sediment remediation, although Table 2 begins a qualitative discussion of limitations of the physical structures in East Waterway. While no changes based on this comment are necessary in the screening memo, the FS will need to go into more detail mapping these areas and pairing structures, with slopes, scour potential, surface and subsurface contamination so that various remedial technology options can be evaluated on a site-specific basis. There will likely be under pier and berth areas that make sense for Dredging, Capping or ENR. Construction Management Areas (Figure 8) are likely too large to define technology usage based on smaller pocket contamination that may exist.

Comment No.	Page No.	Section No.	Comment
50	19	2.5	*6th Bullet – Vertical Depth of Contaminated Sediment* - State the design factor to be applied to volumes and a brief description or reference to a source for assumption.
51	22	3	Remove "where appropriate" from the end of the 2nd sentence at the top of the page and change the last word of the 2nd clause of footnote 1 to "considered."
52	22	3	RAO 3 omits non-SMS chemicals, even though there are ecological risks to benthic invertebrates from non-SMS chemicals (e.g. TBT, as discussed in comments on the Draft Ecological Risk Assessment). Please revise to read "protective levels" consistent with the other three RAOs.
53	22	3.1	Revise Section 3.1 (PRGs) to remove "or ranges of concentrations," and modifiers to ARARs like chemical (or action or location) specific. PRGs could (though aren't commonly) be derived from other ARARs, and the latter 2 "categories" in any case are often confused and thus not very helpful. We have not developed PRG ranges for the LDW and don't expect them for the EW. EPA expects the PRGs will likely be the Bold survey data natural background values for risk drivers as they are for the LDW. While it may be premature to say that in this document, explain that PRGs are ultimately generally 1) the more stringent of ARARs and RBTCs, and then 2) the least stringent of that RBTC/ARAR, and background and PQLs. Also, explain all terms/acronyms briefly, generally in a sentence, when they're introduced, e.g. PQLs.
54	22	3.1	1st paragraph: "The process for developing PRGs will be **described** in the RAO Memo… **Numeric** ~~The~~ PRGs will not be..."
55	24	4	Remove the phrase "by a contractor" in the 3rd sentence of the 3rd bullet, and all other gratuitous references to contractors. The performing party for EPA purposes of all Order or Decree requirements is the named party(s). Such parties typically use contractors but they must be invisible or incidental in submittals. Parties have tried to blame contractors to avoid or mitigate the consequences of contractor action taken in their name. Contractors are not parties to EPA Orders or Decrees under which all response action is performed. For EPA's purposes, the acts of contractors, like the acts of party employees, are the acts of the named party(s).
56	24	4	At the beginning of the section, add a paragraph as to what occurs in this chapter step by step before moving into more detail.
57	24	4	*3rd bullet* - Need to make sure that this discussion is consistent with remainder of memo. Please add "Unless otherwise noted," before "eliminating certain process options may inadvertently limit…"
58	25	4	Last paragraph: Please indicate that if new technologies become viable they may be evaluated in the FS or during design as determined appropriate by EPA.
59	25	4	Where the document notes Remedial technologies and disposal technologies discussed in RETEC 2005 and Tetra Tech 2010 - Add a statement describing the relevance of these documents and why their evaluation is sufficient to cover the extent of cleanup activities that is required for EW Remedial Action.

Comment No.	Page No.	Section No.	Comment
60	27	4	"After the identification and screening steps are completed, the retained technologies (and representative process options) are assembled into a focused set of site-wide alternatives in accordance with CERCLA guidance. Potentially applicable technologies are identified, then eliminated or retained in this section, while assembly and evaluation of site-specific remedial alternatives are provided in Section 5." Combine these two sentences, currently repetitive and not precise.
61	30	4.2.1	There are a lot of notes within Table 2 regarding deteriorated structures requiring structural maintenance in CMAs near areas needing remedial action. There must be a discussion separate from any of the alternatives on how structural maintenance activity costs are broken out from cleanup efforts, how deteriorated structures impact Implementability evaluation, and how deteriorated structures are begin handled for LDW or why this is a new issue. Structural stability issues are effectively ignored except for Alternative E which includes a major cost mark-up.
62	30	4.2.1	Provide a figure that incorporates information described in the Structural Restrictions portion of Table 2, extent of contamination depth under piers (missing information from Figure A1 and A2) and area categorization based on the type of dredging which can be completed for a given area. Currently there is not enough information provided on maps to separate out areas which will require structural renovation for any acceptable dredging type.
63	42	4.2.3.2	Remove or justify the inclusion of the reference in the 2nd sentence to degradation of contaminants- it seems that it is not relevant here consistent with 4.3.3 "Biological processes can be effective at degrading certain organic compounds, reducing mass and/or toxicity. However, biological processes are typically not effective at significantly reducing **PCB and metals** within a reasonable recovery timeframe." Since these are persistent pollutants that have been present for decades, we do not expect degradation to solve the problem within the typical EPA timeframe of 10 years.
64	39	4.3.2	Any use of institutional controls within the waterway will require a use authorization issued by WDNR. Any restrictive covenant relating to State Owned Aquatic Lands, within or without the PMA, will have to recorded by DNR. Please note that here.
65	41	4.3.3	First paragraph: Please describe a typical range of times for a "reasonable recovery timeframe".
66	42	4.3.3.2	3rd sentence: Please change "ENR" to read "MNR".

Comment No.	Page No.	Section No.	Comment
67	43	4.3.4	With regards to the following sentence: "This can occur through several processes including mixing from bioturbation or vessel propwash of the clean material with the underlying contaminants (EPA 2005)." Clarify- is "this" referring to the natural recovery process, referenced in the previous sentence? Mixing, whether caused by bioturbation or prop wash, would not be considered to be natural recovery. Mixing may occur and may dilute the contamination or it may detract from natural recovery by reexposing deeper, more contaminated, sediment. The key mechanism of ENR, as we understand it, is burial. If EWG sees mixing as the relevant mechanism, more discussion is needed. The statement "ENR placement is intended to speed up burial and/or mixing processes" needs clarification—ENR (i.e. placement of a thin layer of sand) would not speed up mixing, but would speed up burial. As stated above, we do not consider mixing to be satisfactory recovery. If burial is the key process for recovery, and if ENR is proposed for use at this site, then we will need site-specific evidence that long-term burial is occurring. Further comments on this topic will follow pending our review of the STER.
68	43	4.3.4.1	Please change the third sentence to read: "Example placement methods are shown in Figure 10, **however other methods may also be implemented**."
69	43	4.3.4.2	Please describe changes to the Phase I interim sand layer thickness observed during recontamination monitoring.
70	47	4.3.5.1	Clarify last sentence in this section "...USACE sent a clarification letter to EPA to provide interim guidance..." and briefly note clarifications provided. If previous statements were the clarifications provided from USACE, make this clearer.
71	48	4.3.5.2	Please edit as follows: "Since capping disturbs relatively little in situ contaminated sediment **(except during the dredging that often precedes capping)**, capping technology..."
72	48	4.3.5.2	Please reconcile the statement in 4.3.5.1 that most capped areas will need to be dredged first to maintain authorized depths with the statement in 4.3.5.2 that capping disturbs relatively little in situ contaminated sediment. Given the need for dredging to accommodate a cap, it seems that capping would have the potential short-term impacts associated with removal described in 4.3.6.
73	48	4.3.5.4	Evaluation of reactive capping must be included here and in preceding sections.
74	50	4.3.6.1	Please explain if the sill area would be a candidate for dry excavation. If so, please address in the Screening Memo. If not, please explain in the response to comments.
75	55	4.3.6.2.3	The last sentence in this section states "For this Screening Memo, only diver-assisted hydraulic dredging is considered suitable for use in underpier areas since mechanical dredging may pose unacceptable risks for damaging the existing structures and/or underpier riprap slopes." Therefore, change the Screening Decision entry in Table 8 for Hydraulic Dredging to be "Retained (in limited areas)."
76	55	4.3.6.3	2nd paragraph: Dredging is highly implementable for the majority of the EW footprint. The text must give dredging a moderate to high rank, except in the limited areas already discussed in this section.

Comment No.	Page No.	Section No.	Comment
77	57	4.3.7	Add note stating what technologies were assessed in this previous assessment cited and why this evaluation is relevant/acceptable for the EW RA.
78	58	4.3.7.1	1st paragraph discusses in-situ technologies, therefore, the last sentence in this paragraph is out of place here. Either add context or move to relevant section related to treatment related to excavated material.
79	58	4.3.7.1	"Granulated Activated Carbon (GAC) has been added as an amendment to a standard ENR sand cover" Please provide citations of past use of GAC in combination with ENR- the citations here (EPA's comment letter and the Ghosh et al review article) were presumably included for the second clause "have been demonstrated to reduce bioavailability..." and are not examples of GAC having actually been added to ENR. Ghosh et al cites Hunter's Point, where AC was added directly to in situ sediments, not as an amendment to a sand cover. Cornelissen et al in ES&T 2011 45:6110-6116. "Remediation of Contaminated Marine Sediment Using Thin-Layer Capping with Activated Carbon – a Field Experiment in Trondheim Harbor, Norway" provides one example.
80	58	4.3.7.1	Please provide citations or reports for the projects named as having demonstrated GAC effectiveness (Grasse River, Hunter's Point, Aberdeen Proving Ground, and U.S. Army Installation in Virgina). Of particular interest are conclusions from these sites as to the effectiveness of GAC placement. There were some early concerns about the GAC placement in the Grasse River and it would be helpful to describe the final result of that implementation. These may be described in the cited Tittabawassee report, but since that report is not readily accessible, please provide a copy to reviewers.
81	59	4.3.7.2	2nd paragraph: Clarify *"for purpose of this Screening Memo, no ex situ treatment will be discussed further in this Screening Memo since ex situ treatment generally does not affect the primary remedial technologies used to achieve surrogate RALS..."* This screening memo is not only focused on meeting RALs, the title also includes disposal. Unless there is a specific reason why ex situ treatment doesn't currently meet screening criteria, then this must be kept in for evaluation in the FS. Recommend phrasing as "will be kept in for limited high concentration sediments which may be more economical to treat than dispose." Not enough evidence has been provided to be removed from FS evaluation but remain available for RD. Please discuss with EPA any concerns of implications to FS.
82	60	4.3.7.2	Change last paragraph, first sentence to state "Other ex situ treatment technologies summarized in Table 9 were evaluated..." If there are more than stated in Table 9, list in this section.
83	62	4.3.7.6	Note that Ex Situ has been retained since separation (and potentially other treatments) were not ruled out. Since Ex Situ treatment has not been fully ruled out, this GRA needs to remain and be noted.

Comment No.	Page No.	Section No.	Comment
84	63	4.4	EPA agrees to the approach used to summarize screening of Disposal Technologies "Retained for design, not carried forward for detailed analysis in the FS." EPA expects similar language would be included in the ROD stating technologies were retained for design in case site conditions change in a way that would overcome previous concerns related to implementability, effectiveness or cost that made any technologies retained but not evaluated in FS, most favorable. If new information made such technology favorable, an FS Addendum would need to evaluate FS criteria to demonstrate such a technology had added advantages.
85	67	4.4.1.1.2	The 1984 West Waterway CAD was placed under the direction of the U.S. Corps of Engineers. DNR did not authorize this CAD, and assumes that it was placed under Corps of Engineers federal authority. Both the dredged material and the CAD were located within federal waterways. Please change text accordingly to reflect this.
86	69	4.4.1.1.3	*Last paragraph: Please note that DNR may have a concern about devoting such a large percentage of the* Elliott Bay site capacity to a Superfund cleanup and coordination is needed.
87	69	4.4.1.1.3	DNR does not own aquatic lands. It manages those State Owned Aquatic Lands pursuant to statutory requirements found in Title 79 RCW, and by rule under Title 332-30 WAC. DNR's policy position has been and is that other feasible alternatives exist for the storage of contaminated sediment other than on State Owned Aquatic Lands. This position is in part based on its participation in the MUDS process, which evaluated engineering, technical, legal, economic and environmental issues. DNR will require a use authorization for any use of State Owned Aquatic Lands. Please add text to address these issues.
88	72	4.4.1.2.3	The technical feasibility of a NCDF is questionable based on future use of the area, and tectonic concerns that are currently being evaluated as part of the Lockheed West CERCLA analysis. Please add text to address this issue.
89	73	4.4.1.2.4	DNR does not own land, it manages State Owned Aquatic Lands pursuant to statute and rule. All references to "DNR land" and "DNR owns" must be revised. DNR would have to approve any "berm" located in the harbor area at T-5, or Lockheed West. The berms at the mouth of slips 27 and 36 would be located within East Waterway. The berm at slip 36 would be located within harbor area and waterway, and subject to the Coast Guards assertion of navigation servitude. The berm at slip 27 would also be located within the waterway and within the Port of Seattle PMA area. DNR is not authorized to permit a berm within a waterway that would impact the public highway purposes of that waterway. The Port requires DNR consent to construct such an improvement within the PMA area and DNR would have to record the restrictive covenant for the improvement located within the waterway.
90	75	4.4.1.3.1	Please acknowledge that DMMP-suitable material from the Commencement Bay (CB) Superfund Site was disposed in the CB open water DMMP site.

Comment No.	Page No.	Section No.	Comment
91	Table 11	4.5	Update Table 11 to incorporate revisions to Tables 4 through 10 specified in other comments, including: (i) Change Hydraulic Dredging to be Retained (in limited areas) (previous comment on Table 8). (ii) Make sure Table 9 and 11 summarize all ex situ treatment technologies evaluated in this report.
92	Table 12	4.5	In section 2.4.3, it notes that Junction Reach, Sill Reach and areas north of Slip 27 have low sedimentation rates and therefore are not highly suited for MNR or ENR. Change these categorizations to match the table.
93	87	5	Add a statement within the first paragraph that clarifies: (1) that the alternatives proposed in this section are not intended to be the final alternatives sent forward to the FS, and (2) that the FS will develop and evaluate alternatives that were successful during this screening evaluation.
94	88	5.1	It is unclear why single technology alternatives were evaluated using only the SQS whereas combined alternatives were evaluated for both SQS and CSL concentrations. Add language justifying why this was done.
95	93	5.1.5	Given that maintaining navigation depths is a nonnegotiable requirement, this alternative must incorporate an estimate of the volume that would need to be dredged to allow for capping. EPA recognizes that the intent here is to describe single-technology alternatives, but based on elevation requirements, it seems that dredging must be considered a component of capping in this case, just as disposal is considered a component of dredging. EPA understands that capping alone (without dredging to allow for appropriate elevations, and without management of underpier areas) will not be considered as a potential remedy.
96	94	5.1.6	The following language needs to be revised: "...dredging all surface and subsurface contaminated sediment within the EW to concentrations that are above detected concentrations of the SQS" Presumably this is a typo and should read "dredging all surface and subsurface contaminated sediments within the EW site ~~to concentrations~~ that are above ~~detected concentrations of~~ the SQS" or something to that effect. Please clarify and change language as necessary.
97	96	5.1.6	Table 16- please explain why dredging addresses a larger acreage than MNR or ENR did in previous tables (176 vs. 129). EPA understands that capping was assumed to cover a smaller area because underpier areas were excluded. Comparing figures 27 and 29 does not make apparent where the difference occurred. Please clarify.
98	96	5.1.7	The scope of this Screening Memo is not intended to evaluate specific differences among sub-Alternative elements but rather to compare a combined alternative with other more basic alternatives to determine if any single technology alternatives can be removed from further evaluation due to low performance. Alternative F has not been highly developed to account for, among other things, all COCs, contaminants in core (given dredge footprints do not line up with Appendix A figures), over water structures, and boat scour areas. Please describe the objectives for evaluating Alternative F1 and F2 which EWG intends to bring forward as a general understanding for FS development.

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99	97	5.1.7	EPA does not consider F1 (SQS) to be a conservative outcome in terms of maximizing the removal of contaminated sediment, because the area may need to be expanded based on the location of non-SMS contamination or toxicity data, and because risk-based thresholds lower than SQS may be established (some are under consideration for LDW and Lockheed West). It is an acceptable estimate for screening purposes in this memo, but must not be referred to as conservative. Please change the language accordingly.
100	97	5.1.7	Text does not match figure 30 regarding No Action in Junction Reach SMA. Clarify. Figure shows ENR in the polygon of SQS exceedance.
101	97	5.1.7	"In situ treatment and ENR will be applied as a combined remedial technology to all underpier areas where surface sediment concentrations exceed the SQS surrogate RAL for both Alternatives F1 and F2." Please add a rationale of using the SQS instead of CSL for F2 in underpier areas.
102	98	5.1.7	Regarding the following passage: "Dredging will be completed to remove surface and subsurface contamination in polygons where surface sediment concentrations exceed either the SQS (Alternative F1) or CSL (Alternative F2) surrogate RALs. Adequate subsurface sediments will subsequently be removed to meet either SQS (Alternative F1) or CSL (Alternative F2) surrogate RALs accordingly." If there is subsurface contamination exceeding the RAL overlaid by cleaner sediment not exceeding the RAL, please explain whether these sediments would be removed.
103	98	5.1.7	The cap described on the previous page was 5 feet thick, but here it is being placed in a 4 foot dredge cut. Please explain whether this makes the waterway shallower by 1 foot, if the document assumes that a thinner cap would be placed here. Please clarify whether this elevation change affects navigation.
104	98	5.1.7	In the Navigation Channel, please explain if there are there any contaminated subsurface sediments that are likely to eventually need to be dredged for navigation that would be left behind under this scenario.
105	110	5.3.5	Cap all Areas exceeding SQS was not evaluated under pier areas, so it is unclear why dredging under pier areas was included in the screening memo. Only Alternative E (Dredging) included costs for structural improvements needed to address under pier contaminants and therefore suggests that dredging as the main components is excessively expensive. While no changes are necessary to the Screening Memo based on this comment, EPA expects that during the FS, dredging a larger area than relayed in Alternatives F1 and F2 (including potential dredging in berth and under pier areas) will be evaluated.

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106	113	5.3.6	Clarify, in this section, the intention of separating out F1 and F2 combined alternatives. It appears that the main point of this exercise (separating Alternative F into 2 alternatives for SMS and CSL concentrations) is to provide an order of magnitude difference in cost estimates. However, EPA does not anticipate that the evaluation provided is representative of costs and likely related to FS costs that involve the combined alternatives for SMS and CSL. Given that the dredge areas were weighted more on surface sediment concentrations (Figure 6) than depth of SMS thickness and depth of CSL thicknesses provided in figures from Appendix A, EPA expects to see both SMS and CSL evaluations within the FS and does not feel that cost estimate differences provided from Alternative F1 and F2 were constructed comprehensively enough to represent likely costs associated with cleanup up to the SMS and CSL. Regarding other general assumptions from this Screening memo, EPA expects to see alternatives which address all and some dredging within the under pier and deep draft berth areas as described in Figure 8.
107	113	5.3.6	Please add a general discussion about the current state of dredging depth relating to keeping the channel to depth required for navigation. Please state what areas of the waterway will require navigation dredging. This must be provided as a standalone figure along with a narrative about the expected timeframe for such dredging.
108	121	6	Change first sentence and any other similar statements within the report to state that the goal of Screening Memo is to "*identify types of remedial and disposal technologies and remedial alternatives to be carried forward...*" Make a note that outcomes from the screening memo determined that combined alternatives appear to be the most promising although the specific combinations described in this memo won't necessarily be passed on to the FS.
109	121	6	In the second numbered item, note technologies that will not be evaluated within the FS but that may remain for Design.
110	App. A	App. A	Please move figures and table in Appendix A to the main body of the report since both are referenced in Section 2.3 and since Appendix A does not include any additional text.
111	App. A	App. A	Figures and tables in Appendix A must be relabeled so "Thickness of All Contamination" becomes "Thickness of SMS Contamination". The FS will account for other COCs, therefore, the current label is not an accurate statement and is inconsistent with how figures based on CSL thicknesses are referenced.
112	App. A	App. A	Underpier areas in Appendix A Figures have been blocked out and not included in volume calculation. These areas need to be displayed to provide a conceptual understanding of near-shore contaminant s at depth. Boundary lines can be used to distinguish areas which the Screening Memo does not wish to include for calculations.
113	Fig. 3	Fig. 3	Color code for Terminal 18 Maintenance Dredging is unclear. Please change to make it more visible.
114	Fig. 4	Fig. 4	Please add a label for the Main Body Reach on Figure 4.

Comment No.	Page No.	Section No.	Comment
115	Fig. 4	Fig. 4	Although the Figure 4 image is based on a photo, it is not possible to confirm the type of structures present as noted in Section 2.1.4. Structures information must be added to Figure 4 or a different figure referenced. Terminal labels are difficult to see in Figure 4, increase size of text or bold captions. Make sure terminal, pier, and slip labels are included in all figures since these terms are referenced throughout the report for various reasons.
116	Fig. 4	Fig. 4	The three reaches are not clearly defined in Figure 4 as noted in this section. Update figure boundaries to relay extent of each reach.
117	Fig. 4	Fig. 4	Note on Figure 4 that values along West side of EW are station reference values.
118	Fig. 5	Fig. 5	"Duwamish Properties" noted in Figure 5 is vague and must be clarified. Markings for Duwamish Properties, Harbor Real Estate, and Communication Cable Crossing as hatch marks are very similar. Please change so that these areas are easily distinguished. Add Communication Cable Crossing to the key. Also, define H.I.C. somewhere on Figure 5.